

pending. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

The title has been amended to be more precise.

Applicant notes with appreciation the Examiner's indication that claims 8, 9, 12 and 13 contain allowable subject matter. Each of these claims has been rewritten in independent form so that claims 8, 9, 12 and 13 are now in condition for allowance.

Claims 1-7, 11 and 14 stand rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Mitsui (US 5,408,345) in view of Kikuchi (JP 05-323336) (or vice versa). These Section 103(a) rejections are respectfully traversed for at least the following reasons.

Claim 1 (and new claim 15) as amended now requires "an electrode pattern for adsorbing an ionic impurity is provided on the interlayer insulating film in the surrounding region so as to surround the display pixel area on all sides." For example, see Fig. 1 of the instant application where electrode pattern 105 for adsorbing ionic impurities surrounds the display pixel area 113 on all sides thereof. The cited art fails to disclose or suggest this aspect of claim 1, either taken alone or in the alleged combination. Moreover, the Examiner suggested during the interview that this feature appears to define over the art of record (see Interview Summary dated Feb. 6, 2002)

The Office Action acknowledges that Mitsui fails to disclose the claimed electrode pattern for adsorbing at least one ionic impurity. Recognizing this flaw in Mitsui, the Office Action cites Kikuchi.

However, Kikuchi's electrodes 3, 6 are provided only along a *single* side of the display pixel area (not surrounding the display pixel area on all sides as required by claims 1 and 15). Thus, even if Mitsui and Kikuchi were combined in the manner alleged in the Office Action (which applicant believes would be incorrect in any event), the inventions of claim 1 (and 15) still would not be met.

Claim 10 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Mitsui (US 5,408,345) in view of Kikuchi (JP 05-323336) (or vice versa). These Section 103(a) rejections are respectfully traversed for at least the following reasons.

Claim 10 requires "an electrode pattern for adsorbing an ionic impurity is provided on the interlayer insulating film in the surrounding region; the pair of substrates are arranged so that a rubbing direction of one of the substrates which is represented by a first arrow crosses a rubbing direction of the other one of the substrates which is represented by a second arrow, the first and second arrows each extending from its tail to its head; and the electrode pattern extends only along one side of the display pixel area interposed between the head of the first arrow and the head of the second arrow." For example, see Fig. 6 of the instant application where pattern 105 extends only along the side of the pixel area between the heads of buffing/alignment direction arrows 301, 302. The cited art fails to disclose or suggest this aspect of claim 10.

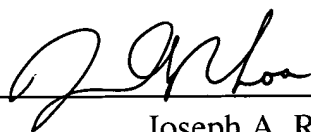
The Office Action cites Kikuchi for this feature. For at the least the following reasons, it is respectfully submitted that Kikuchi fails to disclose or suggest this. It appears that the only drawing in Kikuchi which references an alignment direction is

Figure 9. However, Kikuchi describes Figure 9 as *prior art* and not part of the invention thereof (col. 6, lines 19-20). There is no ion trapping electrode in Kikuchi's *prior art* Fig. 9. The other figures of Kikuchi (which illustrate the ion trap electrodes 3, 6) are silent about rubbing/alignment directions. Thus, it is respectfully submitted that Kikuchi fails to disclose or suggest the aforesaid aspect of claim 10. Thus, even if Mitsui and Kikuchi were combined in the manner alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 10 still would not be met.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn and the application passed to issue. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (Amended) A liquid crystal display device, comprising:

a pair of substrates opposing each other;

a liquid crystal layer interposed between the pair of substrates;

a plurality of switching elements arranged in a matrix pattern on one of the pair of substrates;

gate signal lines for supplying gate signals for driving the switching elements;

source signal lines [crossing the gate signal lines] for supplying display signals to the switching elements;

an interlayer insulating film provided on one of the pair of substrates over the gate signal lines and the source signal lines; and

pixel electrodes provided over the gate signal lines and the source signal lines via the interlayer insulating film, wherein:

the interlayer insulating film on one of the pair of substrates extends to a surrounding region of a display pixel area; and

an electrode pattern for adsorbing an ionic impurity is provided on the interlayer insulating film in the surrounding region so as to surround the display pixel area on all sides.

8. (Amended) A liquid crystal display device, comprising:

a pair of substrates opposing each other;
a liquid crystal layer interposed between the pair of substrates;
a plurality of switching elements arranged in a matrix pattern on one of the pair of
substrates;
gate signal lines for supplying gate signals for driving the switching elements;
source signal lines for supplying display signals to the switching elements;
an interlayer insulating film provided on one of the pair of substrates over the gate
signal lines and the source signal lines;
pixel electrodes provided over the gate signal lines and the source signal lines via
the interlayer insulating film, wherein:
the interlayer insulating film on one of the pair of substrates extends to a
surrounding region of a display pixel area;
an electrode pattern for adsorbing an ionic impurity is provided on the interlayer
insulating film in the surrounding region; and

[A liquid crystal display device according to claim 1, wherein:] the electrode pattern is divided into a plurality of segments; and an electric signal is individually input to each of the segments.

9. (Amended) A liquid crystal display device, comprising:

a pair of substrates opposing each other;
a liquid crystal layer interposed between the pair of substrates;

a plurality of switching elements arranged in a matrix pattern on one of the pair of substrates;

gate signal lines for supplying gate signals for driving the switching elements;

source signal lines for supplying display signals to the switching elements;

an interlayer insulating film provided on one of the pair of substrates over the gate signal lines and the source signal lines;

pixel electrodes provided over the gate signal lines and the source signal lines via the interlayer insulating film, wherein:

the interlayer insulating film on one of the pair of substrates extends to a surrounding region of a display pixel area;

an electrode pattern for adsorbing an ionic impurity is provided on the interlayer insulating film in the surrounding region;

[A liquid crystal display device according to claim 1, wherein:] the display pixel area has a generally rectangular shape;

the pair of substrates are arranged so that a rubbing direction of one of the substrates which is represented by a first arrow crosses a rubbing direction of the other one of the substrates which is represented by a second arrow, the first and second arrows each extending from its tail to its head; and

the electrode pattern extends only along three sides of the display pixel area, including a first side interposed between the head of the first arrow and the head of the second arrow, and second and third sides which respectively extend from opposite ends of the first side.

10. (Amended) A liquid crystal display device, comprising:
a pair of substrates opposing each other;
a liquid crystal layer interposed between the pair of substrates;
a plurality of switching elements arranged in a matrix pattern on one of the pair of
substrates;
gate signal lines for supplying gate signals for driving the switching elements;
source signal lines for supplying display signals to the switching elements;
an interlayer insulating film provided on one of the pair of substrates over the gate
signal lines and the source signal lines;
pixel electrodes provided over the gate signal lines and the source signal lines via
the interlayer insulating film, wherein:
the interlayer insulating film on one of the pair of substrates extends to a
surrounding region of a display pixel area;
an electrode pattern for adsorbing an ionic impurity is provided on the interlayer
insulating film in the surrounding region;

[A liquid crystal display device according to claim 1, wherein:]the pair of substrates are arranged so that a rubbing direction of one of the substrates which is represented by a first arrow crosses a rubbing direction of the other one of the substrates which is represented by a second arrow, the first and second arrows each extending from its tail to its head; and

the electrode pattern extends only along one side of the display pixel area
interposed between the head of the first arrow and the head of the second arrow.

12. (Amended) A liquid crystal display device, comprising:
a pair of substrates opposing each other;
a liquid crystal layer interposed between the pair of substrates;
a plurality of switching elements arranged in a matrix pattern on one of the pair of
substrates;
gate signal lines for supplying gate signals for driving the switching elements;
source signal lines for supplying display signals to the switching elements;
an interlayer insulating film provided on one of the pair of substrates over the gate
signal lines and the source signal lines;
pixel electrodes provided over the gate signal lines and the source signal lines via
the interlayer insulating film, wherein:
the interlayer insulating film on one of the pair of substrates extends to a
surrounding region of a display pixel area;
an electrode pattern for adsorbing an ionic impurity is provided on the interlayer
insulating film in the surrounding region;

[A liquid crystal display device according to claim 1, wherein:] the liquid crystal
display device includes a generally rectangular display pixel area;

a rubbing direction of at least one of the substrates is represented by an arrow
pointing to a corner of the generally rectangular display pixel area; and

the electrode pattern extends along two sides of the generally rectangular display pixel area which are connected together by the corner that is pointed to by the arrow.

13. (Amended) A liquid crystal display device, comprising:
a pair of substrates opposing each other;
a liquid crystal layer interposed between the pair of substrates;
a plurality of switching elements arranged in a matrix pattern on one of the pair of
substrates;
gate signal lines for supplying gate signals for driving the switching elements;
source signal lines for supplying display signals to the switching elements;
an interlayer insulating film provided on one of the pair of substrates over the gate
signal lines and the source signal lines;
pixel electrodes provided over the gate signal lines and the source signal lines via
the interlayer insulating film, wherein:
the interlayer insulating film on one of the pair of substrates extends to a
surrounding region of a display pixel area;
an electrode pattern for adsorbing an ionic impurity is provided on the interlayer
insulating film in the surrounding region;

[A liquid crystal display device according to claim 1, wherein:] the liquid crystal display device includes a generally rectangular display pixel area;

a rubbing direction of one of the substrates is represented by a first arrow pointing to a first corner of the generally rectangular display pixel area, and a rubbing direction of

the other one of the substrates is represented by a second arrow pointing to a second corner of the generally rectangular display pixel area; and

the electrode pattern extends along a first pair of sides which are connected together by the first corner and along a second pair of sides which are connected together by the second corner , wherein the first pair of sides and the second pair of sides may share one side with each other.

Please add the following new claim:

15. (New) A liquid crystal display device, comprising:

a pair of substrates;

a liquid crystal layer between the pair of substrates;

a plurality of switching elements arranged on one of the pair of substrates;

pixel electrodes provided in a display pixel area of the display device;

an insulating film on one of the pair of substrates and at least partially covering address lines, the insulating film extending to a surrounding region of the display pixel area; and

an electrode pattern for adsorbing an ionic impurity provided over the interlayer insulating film in the surrounding region so as to surround the display pixel area on all sides thereof.